

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* HARALD SCHLAG

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Appeal 2007-4409  
Application 10/612,490  
Technology Center 1700

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Decided: November 30, 2007

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Before EDWARD C. KIMLIN, CHUNG K. PAK, and  
JEFFREY T. SMITH *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 through 5, 7 through 11, and 22 through 27, all of the claims pending in the above-identified application. We have jurisdiction pursuant to 35 U.S.C. § 6.

*STATEMENT OF THE CASE*

The subject matter on appeal is directed to “a conductive component for electrochemical cells...” (Spec. 1, para. 0001). Further details of the appealed subject matter are recited in representative claims 1 and 25 reproduced below:

1. A product comprising two spaced apart fuel cell bipolar plates, each bipolar plate having gas flow channels and a doped coating deposited on the bipolar plate, the doped coating comprising at least one of doped diamond coating or doped diamond-like coating, and further comprising an electrolyte membrane interposed between the two spaced apart fuel cell bipolar plates.

25. A product comprising a coating over an intrinsically corrosion resistant and conductive fuel cell bipolar plate having gas flow passages formed therein and gas supply openings and gas discharge openings, said coating comprising at least one of a doped diamond coating or a doped diamond-like carbon coating.

As evidence of unpatentability of the claimed subject matter, the Examiner has relied upon the following references:

Adlhart	US 3,623,913	Nov. 30, 1971
Lemelson	US 5,740,941	Apr. 21, 1998

The Examiner has rejected the claims 1 through 5, 7 through 11, and 22 through 27 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Adlhart and Lemelson.<sup>1</sup>

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<sup>1</sup> The Examiner has also rejected claims 6 and 12 (Ans. 3). However, claims 6 and 12 are no longer pending in the instant Application and are not

The Appellants appeal from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).<sup>2</sup>

*PRINCIPLES OF LAW, FACTS, ISSUES and ANALYSES*

Under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary considerations (e.g., unexpected results). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966). “[A]nalysis [of whether the subject matter of a claim would have been obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007), quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), see also *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006)(“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”); *In re Bozek*, 416 F.2d 1385, 1390 (CCPA 1969)(“Having established that this knowledge was in the art, the examiner

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subject of this appeal as is apparent from the Advisory Action dated October 27, 2006, the Amendment After Final dated September 29, 2006, and the Brief dated October 24, 2006. Accordingly, we limit the Examiner's rejection as being applicable to only claims 1 through 5, 7 through 11, and 22 through 27.

<sup>2</sup> We limit our discussion to claims 1 and 25 consistent with 37 C.F. R. § 41.37(c)(1)(vii) (2005).

could then properly rely, as put forth by the solicitor, on a conclusion of obviousness ‘from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference.’”). “When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product . . . of ordinary skill and common sense.” *KSR Int’l v. Teleflex, Inc.*, 127 S. Ct. at 1742.

As evidence of obviousness of the subject matter defined by claims 1 through 6, 7 through 11, and 22 through 27 under 35 U.S.C. § 103(a), the Examiner has relied on the combined disclosures of Adlhart and Lemelson. As is apparent from the Brief, Reply Brief, and Answer, there is no dispute that Adlhart discloses the claimed fuel cell, except for defining its coating deposited on a bipolar plate having gas flow channels as the claimed doped diamond coating or doped diamond-like coating.

The dispositive question is, therefore, whether one of ordinary skill in the art would have been led to employ the claimed doped diamond coating or doped diamond-like coating as the coating of Adlhart’s bipolar plate within the meaning of 35 U.S.C. § 103(a)? On this record, we answer this question in the affirmative.

As correctly found by the Examiner at page 3 of the Answer, Adlhart at col. 3, ll. 64-75, teaches:

In selecting a suitable material of construction for the bipolar plate, the corrosive environment of the cell and the electrical and thermal conductivity of the material and its cost are consideration. Where weight is also a factor, the plate is

suitably constructed, for example, of aluminum or magnesium having a protective coating, e.g. [,] gold. Other suitable materials include titanium, niobium, tantalum, and alloys, e.g. [,] nickel-tantalum, tantalum-niobium, and graphite, carbon containing plastic composites, and the like.

Although the Examiner has recognized that Adlhart does not specifically mention the claimed doped diamond coating or doped diamond-like coating, the Examiner has correctly pointed out that Adlhart does not foreclose one of ordinary skill in the art from employing other protective coating materials suitable for the corrosive environment (Ans. 4). The Examiner has found, and the Appellants have not disputed, that:

Lemelson in Figure 2 discloses a conductive component [inclusive conductive bipolar plate materials] comprising a metal part (50) having a doped coating (51) in the form of at least one of a doped diamond coating and a doped diamond-like carbon coating (col. 1: 36-41, col. 2: 34-42, and col. 7: 11-col. 9: 10).

Compare Ans. 4 *with* Br. 4-9 and Reply Br. 1-4. Consistent with the Examiner's finding above, we note that Lemelson teaches at col. 2, ll. 34-55, that:

Where employed per se, the term "synthetic diamond" as applied to coatings and articles made of chemically vapor deposited molded, extruded or otherwise formed materials containing carbon atoms which are caused to crystallize into synthetic diamond, may also refer to such diamond-like materials formed of compounded or doped with one or more other elements such as nitrogen, hydrogen, boron silicon, tungsten, aluminum, titanium, iron or other metal or a combination thereof.

It is also known in the art to produce synthetic diamond or diamond-like material from carbon polymers having certain of the carbon atoms thereof arrayed in a diamond-like arrangement....

Finely divided particles of carbon, such as graphite, may also be made to form a coating of synthetic diamond on a substrate...

We find that Lemelson teaches at col. 3, ll. 8-10 that its primary objective is to employ this coating material to prevent “corrosion, erosion and breakage.” We find that Lemelson specifically mentions that its synthetic diamond or diamond-like coating material is useful for protection against corrosion due to chemicals applied during use and cleaning, and in the atmosphere (col. 6, ll. 1-5, col. 8, ll. 44-67, and col. 11, ). We find that Lemelson teaches applying its synthetic diamond or diamond-like coating on any and all articles, including those made of aluminum, steel, other metals, and alloys, subject to various corrosive and high temperature environment (col. 7, ll. 63-67, col. 8, ll. 44-67, and col. 12, ll. 10-33).

Given the above teachings, we determine that one of ordinary skill in the art would have been led to employ the claimed doped diamond or diamond-like coating (carbon) material taught by Lemelson on Adlhart’s aluminum polar plates, with a reasonable expectation of successfully protecting the polar plates from an corrosive environment. *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. at 1740 (“[W]hen a patent ‘simply arranges old elements with each performing the same function it had been known to perform’ and yields no more than one would expect from such an arrangement, the combination is obvious.”) This is especially true in this situation since Adlhart teaches that the selection of an appropriate corrosive protection coating material for its polar plates based on its conductivity, corrosion protection, and cost factors is well within the ambit of one ordinary skill in the art as indicated *supra*. Compare *In re Boesch*, 617 F.2d

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272, 276 (CCPA 1980)(“[D]iscovery of an optimum value of a result effective variable... is ordinarily within the skill of the art.”).

Thus, based on the factual findings set forth in the Answer and above, we determine that the preponderance of evidence weighs most heavily in favor of obviousness of the subject matter defined by claims 1 through 5, 7 through 11, and 22 through 27 within the meaning of 35 U.S.C. § 103. Accordingly, we affirm the Examiner’s decision rejecting all of the claims on appeal under 35 U.S.C. § 103(a).

*ORDER*

In view of the forgoing, the decision of the Examiner is affirmed.

*TIME PERIOD*

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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